Notice of Allowability	Application No.	Applicant(s)
	10/681,596	MASCHKE, MICHAEL
	Examiner	Art Unit
	Thomas R. Artman	2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *27 February 2004*.

2. ☒ The allowed claim(s) is/are *1-4*.

3. ☒ The drawings filed on *08 October 2003* are accepted by the Examiner.

4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☒ All   b) ☐ Some*   c) ☐ None   of the:

        1. ☒ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of

        Paper No./Mail Date _____ .

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date *27 February 2004*

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☐ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

DETAILED ACTION

Allowable Subject Matter

Claims 1-4 are allowed.

The following is an examiner's statement of reasons for allowance: the best prior art of record, Hsieh et al. (US 6,256,368), teaches a method for producing an X-ray image where first and second sets of X-ray image data are taken at first and second times, respectively, at the same projection of the same body region, and where one of the image data sets are subtracted from the other, and the image information in the resulting subtraction image data is emphasized. There is no suggestion to superimpose the subtraction image data onto the second X-ray image data set. The purpose of the image subtraction in Hsieh et al. is to identify and quantify calcifications in the heart. The first and second image data sets are taken at different times of the heart cycle, so that the subtraction reveals only the heart and the calcifications, while all other tissues, including bone, remain stationary between image data set acquisitions and are therefore removed during the subtraction procedure.

Asahina et al. (US 4,943,987) teaches the practice of taking mask image data and contrast image data sets to form subtraction images as part of a standard angiography imaging technique, where the mask and contrast image data sets are taken at different times (but at the same point in the heart cycle) at the same body region and projection. Asahina et al. further superimposes the subtraction images with a third set of X-ray image data that is taken during a catheter procedure (at the same point in the heart cycle as the mask and contrast images, but at a later time) in order

to locate the catheter with respect to the blood vessel region of interest that remained in the subtraction image. Asahina et al. does not teach superposition of the subtraction image data with the second X-ray image data set. The reference is clear that, for the purposes of the invention to work, that is, to accurately track the catheter with respect to the blood vessel region of interest, a third set of images that include the catheter in the body and surrounding tissues is necessary in order for the surgeon to quickly and clearly guide the catheter in real time. Superposition of the second data set with the subtraction image would not contribute to this purpose at all.

In view of Asahina et al., Hsieh et al. is not concerned with determining the location of the calcifications with respect to surrounding body tissues, only with identification and quantification of the calcifications. More importantly, no teaching exists in the art to superimpose the subtraction image data set with the second image data set as claimed.

Therefore, the prior art of record neither teaches nor reasonably suggests a method for producing an X-ray image, where two sets of X-ray image data are taken at two different times, respectively, at the same projection of the same body region, where one of the image data sets are subtracted from the other, the resulting subtraction image data are emphasized and then superimposed with the second data set, as required by the combination as claimed in claim 1.

Claims 2-4 are allowed by virtue of their dependency.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."
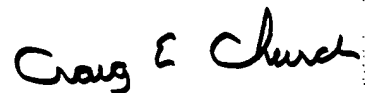
Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure. Kawai (US 5,594,771) teaches highlighting features in a subtraction image resulting

from an angiography procedure by multiplying one of the two image data sets by a coefficient

during the subtraction step.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Thomas R. Artman whose telephone number is (571) 272-2485.

The examiner can normally be reached on 9am - 6:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas R. Artman
Patent Examiner

Craig E Church

Craig E. Church
Primary Examiner